TENNESSEE

Severe Weather

AWARENESS WEEK

February 16th - 22th 2003

Numerous Homes Were Destroyed, Seven Fatalities, and Numerous Injuries in Morgan County on November 10th, 2002

Are You Prepared? Do You Know What to Do?

WEATHER FORECAST OFFICE

MORRISTOWN, TENNESSEE

TENNESSEE SEVERE WEATHER AWARENESS WEEK
February 16 - 22, 2003

Governor Phil Bredesen has proclaimed **February 16 - 22, 2003** as **"SEVERE WEATHER AWARENESS WEEK"** in Tennessee. The National Weather Service, Tennessee Emergency Management Agency, and other supporting organizations ask your help in providing the public with information about severe weather safety. Advance planning and increased awareness will help Tennesseans survive these deadly storms.

Throughout the week, the National Weather Service, Tennessee Emergency Management Agency and other supporting groups will conduct educational activities and drills to help people prevent injuries and deaths from tornadoes, damaging winds, flash floods, lightning, and hail. Each day of the week focuses on a specific type of severe weather or on the warning and drill system.

Monday, February 17 begins the work week with a look at **Severe Thunderstorms**. Damaging winds from severe thunderstorms are much more frequent than tornadoes in the Mid-South. These straight line winds can reach well over 100 miles an hour and can be devastating.

Tuesday, February 18, will focus on **lightning,** one of the underrated killers. All thunderstorms have lightning and this hazard can be deceptively deadly.

Wednesday, February 19, will emphasize **Tornado Safety**. Over and over again, people survive tornadic weather by knowing weather safety rules and taking appropriate and timely actions. **A state-wide tornado drill** will be conducted on this day. Schools and state, county, and other interested agencies are encouraged to participate and help everyone learn life saving rules. Friday will be the alternate drill day if adverse weather is expected on Wednesday.

Thursday, February 20, draws attention to hazards of **Flooding and Flash Floods**. Flooding is the number one weather killer in the United States. Flash Floods are most prevalent in the east half of Tennessee while River Flooding is more common in the western sections.

Friday, February 21, will be the **NOAA Weather Radio and Emergency Alert System Day.**

Saturday, February 22, will highlight **SKYWARN** (Amateur Radio Volunteers) and the **Emergency Managers Weather Information System (EMWIN).**

Please contact the local National Weather Service Offices if you need more information:

Morristown.....Howard Waldron..... (423) 586-8706
Morristown.....Jerry McDuffie..... (423) 586-6429
Nashville.....Jerry Orchanian..... (615) 754-4634
Nashville.....Derrel Martin..... (615) 754-4634
Memphis.....Jim Belles..... (901) 544-0411
Memphis.....James Duke..... (901) 544-0407

StormReady

StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather...from tornadoes to tsunamis. The program encourages communities to take a new, proactive approach to improving local hazardous weather operations by providing emergency managers with clear cut guidelines on how to improve their hazardous weather operations.

Two counties in East Tennessee, Bradley and Jefferson, have already been designated "StormReady". Hamilton County has completed the application process and will soon be designated "StormReady".

To be officially StormReady, a community must:

*Establish a 24 hour hour warning point and emergency operations center.

*Have more than one way to receive severe weather warnings and forecasts to alert the public.

*Create a system that monitors weather locally.

*Promote the importance of public readiness through community seminars.

*Develop a formal hazardous weather plan, which includes training severe weather spotters, and holding emergency exercises.

For more information on what is required for your community contact Howard Waldron at the National Weather Service Forecast Office in Morristown at (423)-586-8706 or Jerry McDuffie at (423)-586-6429.

StormReady information is available on the Internet website: www.nws.noaa.gov/stormready/ .

Severe Thunderstorm Day
Monday, February 17, 2003

Severe thunderstorms can strike any time of the year. Severe thunderstorms and tornadoes, are more frequent in the spring months of March, April and May. Tennessee also has a "secondary" severe weather season in November and December. Severe thunderstorms can, and do, occur anytime of the day and night and during any month of the year.

Damaging thunderstorm winds are much more common in Tennessee than tornadoes.

The National Weather Service defines a thunderstorm as **"severe"** when wind speeds reach **58 mph (50 kts)** or stronger and/or 3/4 in hail (or larger) falls from the storm. Winds from severe thunderstorms can well exceed 100 mph, overturning trailers, unroofing homes, and toppling trees and power lines. Most of the storm damage in the Mid-South is caused by "straight line winds" from thunderstorm downbursts. Severe Thunderstorm wind speeds may equal the wind speeds of weak to strong tornadoes. All thunderstorms are capable of producing deadly lightning.

PLEASE NOTE:
Severe thunderstorms can produce tornadoes with little or no warning!!

Severe Thunderstorm Safety Rules

FIND SHELTER IMMEDIATELY. Go to a sturdy building that will withstand high winds. Avoid electrical appliances, metal pipes and corded telephones.

When a **Severe Thunderstorm Warning** is issued for your location, treat it the same as you would a **Tornado Warning**. Remember that severe thunderstorms can produce damaging winds, large hail and deadly lightning.

Hail Size Estimates
(Diameter in inches)

Pea..... 1/4 inch **Golfball..... 1 3/4 inch**

Penny..... 3/4 inch **Tennis Ball... 2 ½ inch**

Quarter..... 1 inch **Baseball..... 2 3/4 inch**

Half Dollar.. 1 1/4 inch **Grapefruit... 4 inch**

Wind Speed Estimates

Speed (MPH) **Effects**

25-31 ..... Large branches in motion; whistling in telephone wires

32-38 ..... Whole trees in motion

39-54 ..... Twigs Break off of trees; wind impedes walking

55-72 ..... Damage to chimneys and TV antennas; pushes over shallow rooted trees

73-112 ..... Peels surface off roofs; windows broken; trailer homes overturned

113+ ..... Roofs torn off houses. Weak buildings & trailer homes destroyed; large trees uprooted.

Lightning

The Underrated Killer

Tuesday February 18, 2003

EVERY THUNDERSTORM CONTAINS LIGHTNING.

What is Lightning?

The action of rising and descending air within a thunderstorm separates positive and negative electrical charges. Lightning results from the buildup and discharge of electrical energy between these positively and negatively charged areas. Lightning charges may reach as high as 100 million volts. This electrical charge is always searching for the path of least resistance to complete the circuit. Lightning will normally strike the tallest object in the area of the potential discharge. Tall trees, light poles and telephone lines are frequent targets for lightning strikes. Lightning is always a potential killer. Whether the storm is a large spring-time severe storm or the more common afternoon variety, it contains this deadly killer. It may strike an isolated tree or an object out in the open, **or it may strike you**. Keep in mind that you do not have to be standing directly beneath a cloud to be hit. Lightning may strike many miles from the parent storm. **In an average year lightning will claim more victims than tornadoes or hurricanes!**

LIGHTNING SAFETY RULES OUTDOORS

Seek shelter inside a house, large building or an all metal vehicle with the windows rolled up (avoid convertibles).

If your hair stands on end and your skin tingles... lightning is about to strike. Take cover immediately.

If you can't find appropriate shelter, get down to avoid being the highest point for a lightning discharge. When caught in the open, seek shelter in a low area. Crouch down and cover your head with your hands. If you are with a group of people, everyone should scatter out before crouching.

If caught in a wooded area seek out the area with the smallest trees. Stand at least five feet from the trunk of the nearest tree to avoid flying bark, should the tree be hit by lightning.

When boating, head for shore and get into a shelter, or vehicle. If caught in a boat, lie down in the boat with cushions between you and the boat's side and bottom.

AVOID

Large trees, hilltops and other high places.

Chain link fences and any other metal fences like those around ball parks and play grounds.

Pools, motorcycles, scooters, golf carts, small metal sheds, bicycles, tractors and farm equipment that does not have an enclosed metal cab.

Do you know what group of people are most likely to get struck by lightning? It is farmers, followed then by golfers.

LIGHTNING SAFETY RULES

INDOORS

Stay away from windows. Avoid telephones and electrical appliances (wires connecting to these devices run outside of the home and act as lightning rods). Don't wash dishes or take a shower. The pipes will conduct electricity.

Unplug computers and other sensitive electrical devices (time permitting) since surge suppressors may not protect these items if lightning hits close to the home.

Remember, there is no truth to the old myth that "lightning never strikes twice."

Take time this week to learn or refresh your memory on lightning safety rules. That quick dash out in the open when a thunderstorm is in progress may unnecessarily expose you to the possibility of being struck. It is not worth the risk.

If a person is struck by lightning, there is no residual charge left on the body. The quick application of CPR may maintain vital body functions until medical help can be obtained.

Large Hail - An Added Hazard

The strong rising currents of air within a storm, called updrafts, carry water droplets to a height where freezing occurs. Ice particles grow in size and become too heavy to be supported by the updraft and then fall to the ground as hail. Large hailstones may fall at speeds faster than 100 mph. Light reflecting from the large hail high up in the storm often gives the storm an eerie yellow green color. This is an indication that this storm may be strong.

Hail rarely causes deaths, but injuries do occur. If you are outside, move inside a building or a car with a hard top. Make sure that outdoor pets and other animals have access to shelter.

TORNADO AWARENESS AND DRILL DAY
WEDNESDAY FEBRUARY 19, 2003

TORNADOES...WHAT ARE THEY?

NATURE'S MOST VIOLENT STORMS!

A TORNADO is a violently rotating column of air extending from the base of the thunderstorm and in contact with the ground (when it is not in contact with the ground, it is called a **FUNNEL CLOUD).** Tornado winds average 100 mph, but can exceed 300 mph. The strongest tornadoes develop from severe thunderstorms in atmospheric conditions with a wind profile that varies with height. Severe thunderstorms and tornadoes occur most often in the Mid-South in the months of March, April, and May. A secondary season occurs in the Fall, typically November and December. Most tornadoes occur in the afternoon and evening. However, tornadoes have occurred in every hour of the day and night and every month of the year. No location, time of day, or time of year is immune to tornado occurrences.

Your Safety will improve if you stay alert to the risk of tornadoes from thunderstorms that approach. This is especially true if a **TORNADO WATCH** is in effect. Conditions should be carefully monitored when severe thunderstorms are occurring, or are expected to occur.

Severe Thunderstorms can produce tornadoes with little or no warning.

Know the difference between a

TORNADO WATCH
and a
TORNADO WARNING.

A TORNADO WATCH
means tornadoes may develop, so keep an eye to the sky for thunderstorms and the dangers they pose. Listen to NOAA Weather Radio, commercial radio, or TV for weather statements or warnings. A **WATCH** allows time to plan what to do if a tornado approaches. A watch usually spans several thousand square miles, and can cover parts of more than one state.

A TORNADO WARNING
means a tornado has been sighted, or is indicated on weather radar.

Persons in the path of the tornado should seek shelter immediately.

Drill Day
WEDNESDAY, FEBRUARY 19, 2003
9:00 - 9:30 LOCAL TIME

A TORNADO DRILL will be conducted Wednesday morning, February 19, 2003, between 9:00 AM and 9:30 AM **Local Time**, weather permitting, as part of SEVERE WEATHER AWARENESS WEEK in Tennessee. If Wednesday's weather is inclement, the test will be Thursday, February 20, 2003 (same times).

Sometime during this hour, each National Weather Service office in the state will issue a drill message. These messages will be sent under the following NWS communication headers: **MEMTORMRX, MEMTORBNA and MEMTORMEM.** Media outlets with automated systems that relay these headers may want to take special actions to optimize relay of these tests to meet their special needs on Drill Day.

The test message will be broadcast on all NOAA Weather Radio Transmitters across Tennessee.

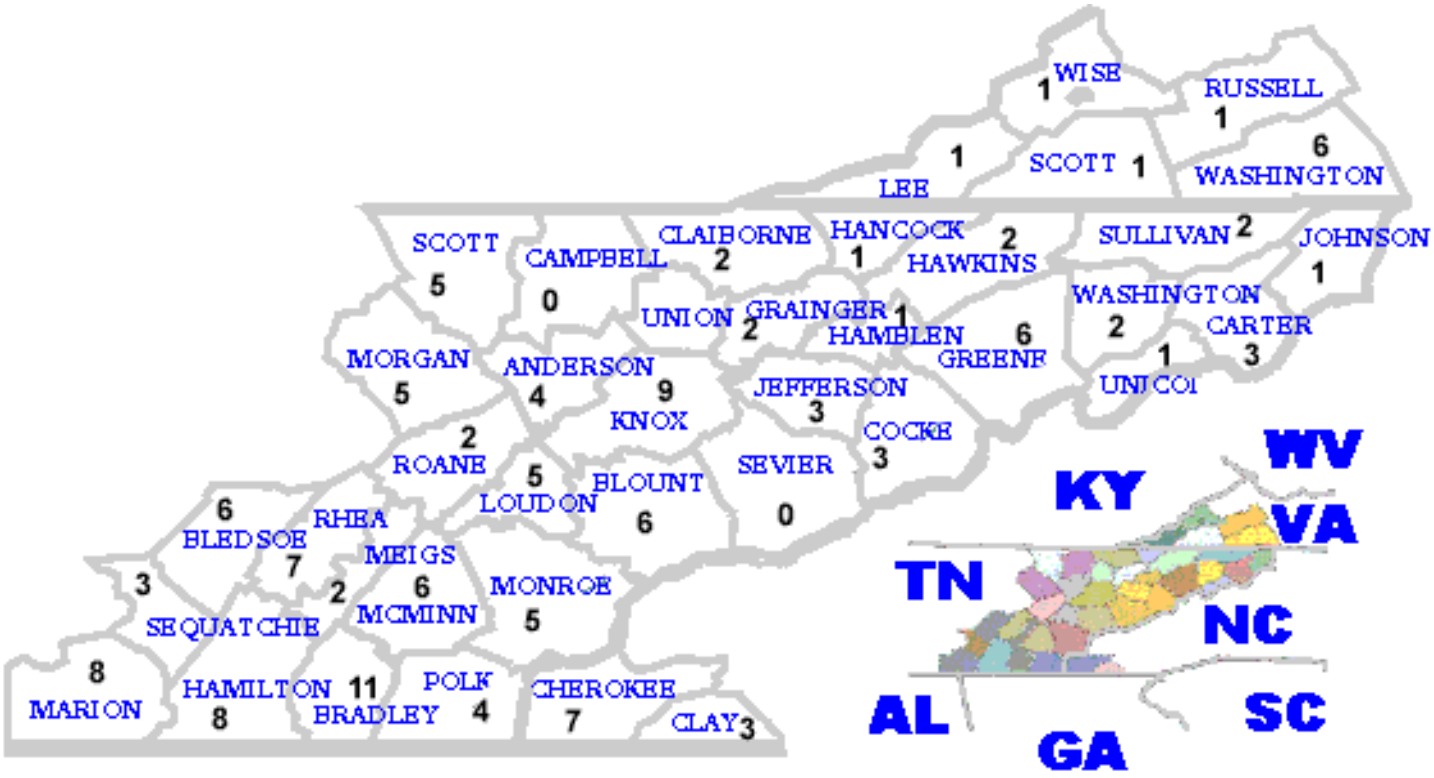
We ask television and radio stations to relay the drill message to the public in the same manner as you would relay an actual tornado warning. This will allow the complete "**Warning System**" to be tested. We ask local emergency management agencies to activate their warning system (radio alerting devices, outdoor sirens, etc.) to make sure they work as expected.

A Drill such as this gives schools, churches, business offices and plant safety managers across the state a chance to check the readiness of their Severe Weather Safety plans. If your office has a plan already in place, test it to make sure your employees know how to respond properly. If your employees know how the safety procedures work, they can carry them out effectively when the time comes.

IF YOUR WORK PLACE, SCHOOL OR CHURCH DOES NOT HAVE A SAFETY PLAN, NOW IS THE TIME TO START ONE!! Developing a safety plan is not difficult. If a plan is easy to operate, it is more likely to be successful when needed. Countless lives are saved each year by planning, preparedness and proper education. The U.S. population has grown in recent years, yet the number of tornado deaths has diminished. This is due to agencies and individuals developing Weather Safety Plans and to people reacting in a prudent manner when severe weather threatens their areas.

YOUR SAFETY AND THAT OF YOUR FAMILY, FRIENDS & CO-WORKERS DEPENDS ON YOU!!

Tornadoes for the Morristown County Warning area of East Tennessee, extreme southwest Virginia, and extreme southwest North Carolina, 1950-2002



Tennessee averages about 12 tornadoes each year, resulting in an average of 3 fatalities. East Tennessee alone averages about 3 tornadoes each year. Our peak season for tornadoes are during March, April and May, and are most likely to occur between 3 and 9 PM. A secondary maximum of tornadoes will occur in November and December of which we have a very sad reminder this past November 10th.

Meteorologists rate the intensity of a tornado on the **F** scale or **Fujita** scale. This scale was developed in the early 1970s by Dr. Theodore Fujita. There are six levels of intensity starting with

F0 being the weakest and F4 being the strongest. The wind speeds in a tornado can range as low as 40 mph (F0) and reach in excess of 300 mph (F5).

No place is immune to tornadoes. Tornadoes have been known to occur at all hours of the day or night and at any time of the year.

Every state, in the United States, has reported a tornado. Even Yellowstone National Park had a tornado at an altitude of 10,000 feet on July 21, 1987. This F4 tornado had a path length of 24 miles and a path width of 1.4 miles. 15,000 acres of trees were downed. Mountains and hills do not protect you from tornadoes.

The average tornado moves from southwest to northeast, but tornadoes have been known to move in any direction. The average forward speed is 30 mph, but vary from nearly stationary to 70 mph.

The "Tri-state Tornado" on March 18, 1925 was one of the worst tornadoes on record. This F5 tornado had a path length of 219 miles, had an average forward speed of 62 mph and was on the ground for about 31/2 hours. The tornado started in southeast Missouri, roared through southern Illinois and ended in southwest Indiana. There were 695 deaths. 234 deaths occurred in Murphysboro, IL, which made it the largest death toll within a single city, in U.S. history.

A listing of tornadoes, by state, can be found at the website of the National Climatic Data Center at **www.ncdc.noaa.gov/**

Fujita Intensity Scale (F Scale)

This scale is named after Dr. T. Fujita, the noted meteorologist who has studied tornadoes extensively and classified the damage created by these storms.

F Scale	Speed	Damage Threat
F0 (weak).....	40-72 mph	Light damage...shallow rooted trees pushed over.
F1 (weak).....	73-112 mph	Moderate damage...mobile homes overturned; roof surfaces peeled off.
F2 (strong).....	113-157 mph	Considerable damage...large trees uprooted...mobile homes destroyed
F3 (strong).....	158-206 mph	Severe damage..trains overturned; well built homes lose roofs and walls
F4 (violent).....	207-260 mph	Devastating damage..well built homes leveled; cars tossed about
F5 (violent).....	261-318 mph	Incredible damage...well built homes disintegrate; cars thrown more

Flash Flooding and River Flooding

Thursday, February 20, 2003

Flooding and Flash Flooding are the number one weather related killer!

Most flood deaths occur at night and when people become trapped in automobiles that stall in areas that are flooded.

Flash floods occur within a few minutes or hours after excessive rainfall, a dam or levee failure, or a sudden release of water held by an ice jam or mud slide. Flash floods can tear out trees and destroy buildings and bridges.

Because flash floods happen in a short period of time, generally less than six hours, they are more life threatening than general floods or river flooding. Areas most susceptible to flash flooding are mountainous streams and rivers, urban areas, low-lying areas, storm drains, and culverts. The rugged terrain of Middle and East Tennessee have potentially more flash flood problems than West Tennessee but all parts of the state are susceptible.

The National Weather Service issues a **Flood or Flash Flood Watch** when conditions are detected that can result in flash flooding within a designated area, but the occurrence is neither certain nor imminent.

Persons in the watch area are advised to check flood action plans, keep informed, and be ready to take action if a warning is issued or flooding is observed.

A Flash Flood Warning is issued when flash flooding has been reported or is imminent. It focuses on specific communities, streams or areas where flooding is imminent or occurring. Persons in the warned area are advised to take necessary precautions immediately.

RIVER FLOODING: This type of flood is caused by an increased water level in an established watercourse, such as a river, creek, or drainage ditch. River flooding is generally slower to develop than flash flooding. There can be exceptions to this, especially with some smaller rivers where the time lag between the runoff from heavy rain and the onset of flooding can be very short. This can be the case with several east Tennessee rivers and streams. On the other hand, it may take several days for a flood crest to pass downstream points on major rivers.

The National Weather Service issues **River Flood Warnings** when rivers are expected to rise above flood stage. River stages and crest forecasts are given for selected forecast points along with known flood stages for each forecast point. While there is usually more advanced warning time with river floods than with flash floods, persons should be familiar with the flood prone areas they live and work in, and must know what action to take and where to go if a flood occurs. Advance planning and preparation is essential.

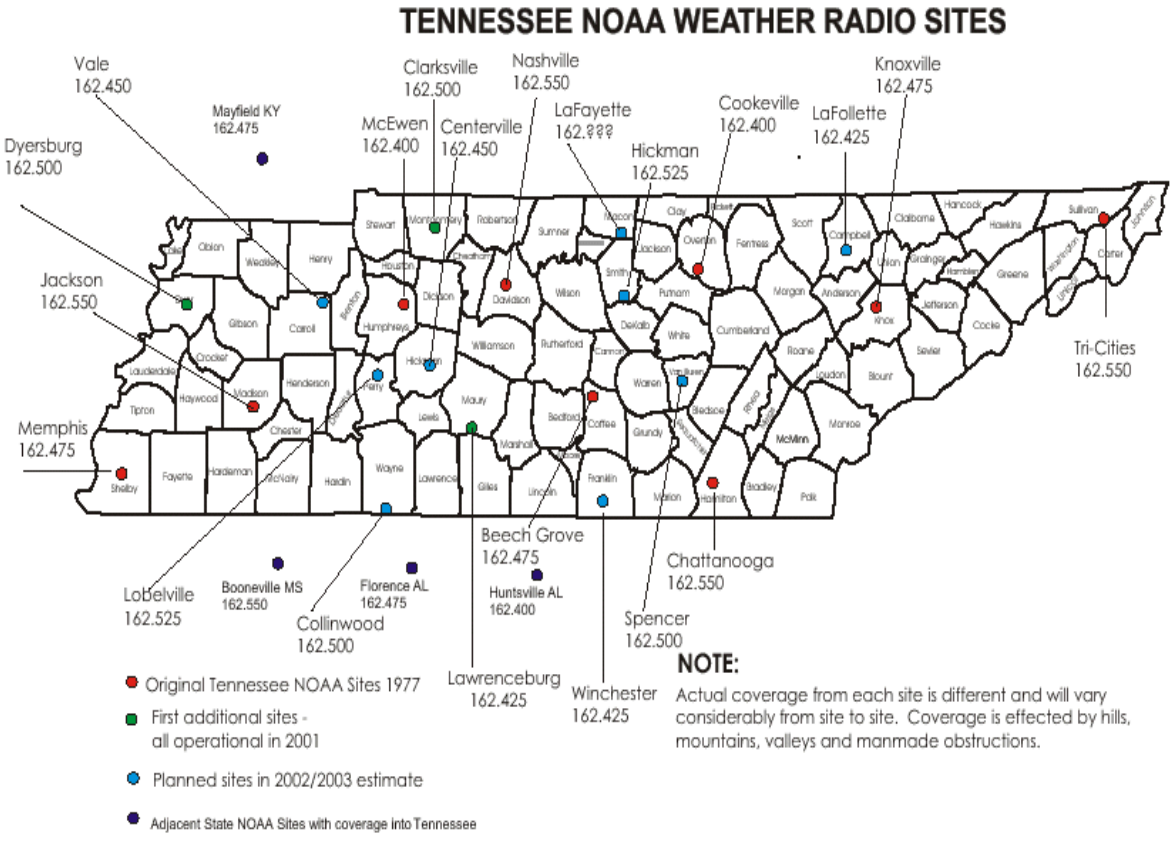
FLOOD SAFETY RULES:

- Get out of areas subject to flooding. These include dips, low spots, stream beds, drainage ditches and culvrts. If caught in low areas during flooding, go to high ground immediately.
- Avoid already flooded and high velocity flow areas. A rapidly flowing stream or ditch can sweep you off your feet or even sweep your car downstream.
- Be especially cautious at night when it is harder to recognize flood conditions.
- Do not drive through flooded areas. As little as a foot of water can wash away cars. Also, the road bed may be washed away.
- If your vehicle stalls, abandon it immediately and seek higher ground. The rising water may engulf the vehicle and the occupants inside.
- Do not camp or park your vehicle along streams or washes during threatening conditions.
- When a Flash Flood WARNING is issued for your area act quickly to save yourself. You may only have seconds.
- **GO TO HIGHER GROUND - CLIMB TO SAFETY**!

Planning - The Key to Your Survival During Severe Weather
Friday, February 21, 2003

NOAA Weather Radio is an excellent and the quickest way to receive WARNINGS from the National Weather Service. All weather warnings are now completely automated and placed on the appropriate transmitter. The National Weather Service continuously broadcasts updated weather watches, warnings and other weather information 24-hours a day. Affordable ($20-$30) radios can be purchased to receive weather broadcast on 162.400, 162.475 and 162.550 MHZ. These radios usually have several other frequencies in the same range for receiving information from National Weather Service offices in other areas transmitting on 162.425 MHz, 162.450 MHz, 162.500 MHz and 162.525 MHz. A new NOAA Weather radio transmitter is scheduled to be installed later this spring in East Tennessee. It will be on Walnut Mountain above LaFolette.

Tennessee NOAA Weather Radio Frequencies



*

*What to Listen For**

TORNADO WATCH:
Tornadoes are possible in the designated WATCH area. Remain alert for approaching storms. Keep track of the latest forecasts and be ready to take cover if severe weather threatens.

TORNADO WARNING:
A tornado has been sighted or indicated by Doppler Weather Radar. Warnings mean that severe weather is occurring!! **TAKE COVER IMMEDIATELY!!**

SEVERE THUNDERSTORM WATCH:
Severe Thunderstorms are possible in the designated WATCH area.

SEVERE THUNDERSTORM WARNING:
Severe Thunderstorms are occurring. Move to your planned place of safety. **Remember, Severe Thunderstorms occasionally produce tornadoes with little or no warning!!**

FLASH FLOOD or FLOOD WATCH:
Flash flooding or flooding is possible in the designated WATCH area. Be alert.

FLASH FLOOD or FLOOD WARNING:
Flash flooding or flooding has been reported or is imminent. Take necessary precautions at once.

URBAN and SMALL STREAM FLOOD ADVISORY:
Flooding of small streams, streets, and low-lying areas such as underpasses and urban storm drains is occurring.

NOAA Weather Radio is the most reliable and fastest way to obtain your Watches and Warnings 24 hours a day!

Saturday, February 22, 2003

SKYWARN IN TENNESSEE

The Eyes and Ears of National Weather Service in the field

SKYWARN is the program developed by the National Weather Service to recruit and train storm spotters. SKYWARN spotters enhance the National Weather Service's storm detection capabilities by identifying and reporting potentially dangerous weather conditions. The SKYWARN program has become an invaluable link in the NWS warning process.

Despite all of the sophisticated technology used in a modern NWS office, forecasters still rely on storm spotters. Doppler radar may indicate that a storm may be producing large hail, damaging winds or even a tornado, but it cannot tell exactly what's happening on the ground underneath the storm. Storm spotters, trained by NWS meteorologists, act as the eyes and ears of the NWS. Their reports, radar data and other information result in the most timely and accurate warnings possible.

SKYWARN spotters in Tennessee come from all walks of life - law enforcement, fire or emergency management agencies and citizens interested in helping their communities. A large number of storm spotters are amateur radio operators, who volunteer their time and equipment to help the NWS detect and track severe storms. Amateur radio operators, or "hams", will frequently man radio equipment at the local NWS office, gathering reports from spotters in the field and relaying the data directly to NWS forecasters. SKYWARN spotters are volunteers - they receive no compensation for their hard work. They do, however, have the satisfaction of knowing that their reports result in better warnings which save lives. For more information on SKYWARN, or to schedule a storm spotter class in your area, contact the nearest office of the National Weather Service.

When severe weather threat is imminent, the NWS <u>needs</u> accurate local weather reports from officially trained observers to identify and report hazardous weather conditions in their area. These reports must be forwarded through authorized communications channels. Amateur radio is ideally suited to make these reports. Ground truth reports are needed to correlate with observations from scientific information gathering tools such as the NEXRAD radar. Official spotters attend an official spotter training session conducted by the NWS at least every 3 years. Accuracy helps guarantee warnings are issued for severe weather, while keeping false alarms to a minimum. Speed is needed to give as much warning as possible to areas in the path of severe weather. **Lives can be saved by early warning!**

National Weather Service Internet Home Page Information

There is a wide variety of weather information on the Morristown homepage. Watches, warnings, forecasts, radar, satellite, aviation, fire weather, hydrology, spotter classes, climate information, storm summaries, tornado database, and links to other NWS offices are available at:

NWS Morristown: www.srh.noaa.gov/mrx

NWS Nashville: www.srh.noaa.gov/bna

NWS Memphis: www.srh.noaa.gov/meg

Interested in getting additional weather data? Here is a special method!

Emergency Managers Weather Information Network (EMWIN)

The National Weather Service has a method of distributing weather information on a national basis. EMWIN information is distributed as a data signal relayed through the weather satellites. Software allows your personal computer to display weather information 24 hours a day.

The main purpose of the EMWIN is to provide timely warnings of approaching severe weather. EMWIN prioritizes the data with warnings and severe weather summaries transmitted first. Routine weather, satellite images and weather graphics are also transmitted. The service is public information and is free - there are no monthly fees to receive the data. The only cost is for the receiving equipment and inexpensive commercial software.

The software to display the EMWIN data runs under Windows 95 or Windows 98 and takes about 20MB of hard disk space. Several companies provide reasonably priced ($600-$1,000) satellite receivers to capture the EMWIN signal. Efforts are being made to receive the EMWIN satellite data and retransmit it on a UHF/VHF frequency. This would allow anyone with a computer and a radio receiver to get EMWIN data for a one-time cost of around $200. Check your closest National Weather Service Office home page for more information as these systems become operational.

EMWIN data is not intended to replace any existing weather disseminations systems. EMWIN will be a cost effective system for supplementing NOAA Weather Radio Data and other systems where a full suite of data is not needed. Call your local National Weather Service office for EMWIN activities in your area.